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QUERCUS MACROCARPA VAR. DEPRESSA (NUTT.)
ENGELM¹

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IN western Iowa and the adjacent parts of Minnesota, South Dakota and Nebraska a shrubby oak is frequently found at the borders of prairie groves and on upland prairie. This form was evidently formerly abundant even in eastern Iowa, for the notes of the original U. S. land surveys of Johnson County (made chiefly in 1837, before the settlement of the region) contain frequent references to "grub oaks," "scrub oaks," "grub bur oaks" and "bur oak scrubs."

This was the shrub which occupied the borders of the prairie groves in Iowa, excepting in the north-central and northeastern parts of the state, where *Quercus ellipsoidalis* often replaced it.

It was first described by Nuttall (Genera of North American Plants, vol. II, p. 215; 1818) as *Q. obtusiloba* β . **depressa*. Later, DeCandolle (Prodromus, vol. XVI, pt. 2, p. 22; 1868) published the variety under the name *Q. stellata* γ . *depressa*, *obtusiloba* being a synonym of *stellata*.

Nuttall's description is very brief, merely citing that it is found "fruiting at the height of 12 to 18 inches from the ground, scarcely ever exceeding 3 feet," but the locality and habitat, "on the hills of the Missouri to the confluence of the river Platte," make the designation of this form definite, for there is no other similar oak in that region.

This form was first given its proper place under *Q. macrocarpa* by Engelmann (The Oaks of the United States, Trans. of the Acad. of Sci. of St. Louis, vol. III, no. 3, p. 382; repr. p. 11; 1876) in the statement that "throughout the north-west, north of the Missouri

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river, a low scrubby form is found, which might be designated as var. *depressa*, as it is undoubtedly the *obtusiloba* β . *depressa*, Nutt. gen. 2, 215, which has smaller leaves and much smaller acorns than the species, but is clearly a form of *macrocarpa*."

Later (1892) MacMillan (The Metaspermae of the Minnesota Valley, p. 192) merely gave Nuttall's name as a synonym of *Q. macrocarpa*, without recognizing the variety.

Neither Gray's nor Britton's Manual, nor Britton and Brown's Illustrated Flora, nor Sargent's Sylva of North America, mention the variety.

In some of the writer's earlier papers this form was reported as *Q. macrocarpa* var. *olivaeformis*, but was first recognized under its correct designation in 1915 (The Plant Geography of the Lake Okoboji Region, Bull. Lab. Nat. Hist., State University of Iowa, vol. VII, no. 2, p. 31).

Trelease (The American Oaks, Memoirs of the National Acad. of Sciences, vol. XX, p. 108, 1924) also recognizes this as a form of *macrocarpa*.

In Dr. Rydberg's posthumous "Flora of the Plains and Prairies" (1932) this form is described as a new species, *Q. mandanensis*. Specific reference is made to this as the same as *Q. obtusiloba* β . *depressa* Nutt, "not *Q. depressa*,"—the latter evidently *Q. depressa* Humb. & Bonp., described in 1809. He does not connect it in any way with *Q. macrocarpa*, excepting to say that "it probably hybridizes" with that species.

There can be no question that this is a mere form or variety of *Q. macrocarpa*. On the loess and drift hills of western Iowa, where it is still frequent, it usually occupies the tops of the hills in its most extreme form, fruiting specimens often being less than one foot in height, and on the sheltered sides of the hills grades down into forms which at the foot of the hill are true *Q. macrocarpa*, often exceeding 50 feet in height. The plants gradually increase in size downward and there is no line of demarkation between the variety on the upper part of the slope and the typical form at the base.

It should also be noted that *Q. stellata*, to which this was originally referred, does not occur in the region under consideration, being found in Iowa only near the southern border of the state, especially eastward.

Rydberg's effort to distinguish *Q. mandanensis* from *Q. macrocarpa*

in his key to the genus (p. 263) is not successful. He defines the two "species" therein as follows:

- Cup 20 mm. wide, conspicuously fringed; acorns subglobular or round-ellipsoidal, 15–20 mm. in diam.; tall tree 10–50 m. high.....*Q. macrocarpa*
 Cup 10 mm. wide, slightly fringed, only the innermost scales caudate-attenuate; acorns ovoid, about 10 mm. in diam.; shrub 1–6 m. [in the description this is given as 1–5 m.] high, often with corky branches.....*Q. mandanensis*

The above-named differences are by no means constant. The cup and acorn of var. *depressa* are smaller than those of the larger easterly forms of *Q. macrocarpa*, but they grade insensibly into the forms of the latter which are found in the drier portions of the region. The writer has collected acorns from rather large trees of *Q. macrocarpa* in dry situations which measure as low as 8–10 mm. in diam., while those of var. *depressa* often exceed 12 mm.

Both forms have the cups varying from distinctly fringed to slightly, or even scarcely fringed. Indeed, some of the cups of var. *depressa* which the writer collected in Shelby County have the cup relatively more conspicuously fringed than in any of our forms of *macrocarpa*.

The shape of the acorns is also so variable in both that it forms no distinctive character.

As previously noted, the size of the plant is also of little use as the two forms intergrade perfectly in this respect.

The corky branches also offer no distinction, for they are usually also found on *Q. macrocarpa* in drier situations.

In the descriptions of the two forms (pp. 264–5) it is further stated that the fruit of *Q. macrocarpa* is short-peduncled, while that of *Q. mandanensis* is subsessile or sessile. This character is also variable in both, and constitutes no specific criterion.

It is therefore evident that *Q. mandanensis* is not worthy of specific rank. It is even doubtful that it should be accorded varietal rank, since the transition is so complete. As in so many of our modern "species," the few extreme, or "typical" specimens in the herbaria may appear to be quite distinct, but the distinction fails in the field when large series are examined.

There is one reason, however, for preserving the varietal name. It is very convenient in ecological discussions, for the variety is invariably found in dry, exposed situations and it is convenient to designate the form by a name. The name of this variety should be then, *Q. macrocarpa* var. *depressa* (Nutt.) Engelm,

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